

## REMARKS

Claim 1 has been amended. Claim 5 has been canceled. New claims 22-24 have been added. Thus, claims 1, 3, 4 and 7-24 remain presented for examination. Support for the amendment to claim 1 may be found in the published application at paragraph [0045]. Support for new claims 22-24 may be found in previous claims 1, 7, and 8, and in paragraph [0051]. Thus, no new matter has been added and entry of these amendments is respectfully requested. Reconsideration and withdrawal of the present rejections in view of the amendments and comments presented herein are respectfully requested.

### Prior art rejections

#### **Hirayama et al. (US 2005/0014090)**

Claims 1, 3, 5, 7-13, 16-17, 19 and 21 were rejected under 35 U.S.C. § 102(e) as being anticipated by Hirayama et al. (US 2005/0014090). However, this reference does not qualify as prior art with respect to the presently pending claims. The present application claims priority to three Japanese applications filed on June 5, 2003, December 25, 2003 and March 2, 2004. Enclosed herewith is a copy of a certified translation of one of these Japanese priority applications, (JP 2004-57449), filed on March 2, 2004, which is virtually identical to the present application. Thus, all of the presently pending claims are entitled at least to the March 2, 2004 priority date.

The Hirayama et al. publication cited by the Examiner was published on January 20, 2005, and is based on an application that was filed on May 13, 2004, which is after the priority date of the present application. Moreover, the Hirayama reference is a CIP of a PCT application, PCT/JP2004/000704, which was published as WO/2004/068242 on August 12, 2004, which is also after the priority date of the present application. Although this PCT publication was filed on January 27, 2004, the publication was in Japanese, and therefore, the PCT publication does not qualify as prior art under 35 USC 102(e). See the attached Exhibit A, which is a printout of the bibliographic data regarding this PCT application from the WIPO website. Therefore, neither the US nor the PCT publication of Hirayama qualifies as prior art under any subsection of 35 USC 102.

**Kawasato et al. ((US 2003/0049456)**

**Przybilla et al. (SPIE, 1672, Advances in Resist Technology and Processing IX, 1992)**

**Pawlowski et al. (US 6,358,665)**

**Feiring et al. (US 2005/0203262)**

Claims 1, 3 and 19 were rejected under 35 U.S.C. § 102(b) as being anticipated by Kawasato et al. (US 2003/0049456).

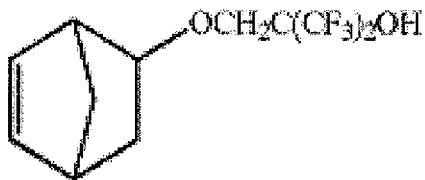
Claims 1, 3-5, 7, 11-13, 16-17, 19 and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by Przybilla et al. (SPIE, 1672, Advances in Resist Technology and Processing IX, 1992).

Claims 1, 3, 5, 7-13, 16-17, 19 and 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative under 35 U.S.C. § 103(a), as being obvious over Pawlowski et al. (US 6,358,665).

Claims 1, 5, 18 and 20 were rejected under 35 U.S.C. § 103(a), as being obvious over Feiring et al. (US 2005/0203262).

Claim 1 recites a resin for a photoresist composition, comprising a  $-CR^1R^2OH$  group **only at a terminal of a principal chain of the resin.** Thus, the  $-CR^1R^2OH$  group is not at a plurality of side chains of repeating units in a principal chain of the resin. This concept is illustrated in Exhibit B, which shows the introduction of these groups only at a terminal of a principal chain through the use of a transfer agent containing a  $-CR^1R^2OH$  group.

Kawasato et al., Przybilla et al., Pawlowski et al. and Feiring et al. all disclose a resin containing a monomer which contains a  $-CR^1R^2$  group. In all of these references, a  $-CR^1R^2OH$  group is bonded to a side chain of a repeating unit (see paragraphs [0057] and [0058] of Kawasato et al; page 501 of Przybilla et al; col. 14, lines 1-3 of Pawlowski et al.; and paragraph [0071] and the Examples of Feiring et al.). Thus, in the disclosure of each of these references, there are a plurality of  $-CR^1R^2OH$  groups inside the principal chain, not only at the terminal of a principal chain as recited in the present claims. This is clear from the Examples of Fiering et al., which show that the amount of the NB-F-OH group shown below is around 40%:



..... NB-F-OH

None of the cited references describe or suggest a transfer agent containing a  $-\text{CR}^1\text{R}^2\text{OH}$  group. As such, it is impossible to have a structure in which a  $-\text{CR}^1\text{R}^2\text{OH}$  group is introduced only at a terminal of a principal chain of the resin. Thus, claims 1, 3, 4 and 7-22 cannot be anticipated or rendered obvious by any of these references, either alone or in combination.

New claim 23 recites a resin for a photoresist composition, comprising: a  $-\text{CR}^1\text{R}^2\text{OH}$  group which is introduced at a terminal of a principal chain of the resin; and a structural unit derived from a (meth)acrylate ester containing an acid dissociable, dissolution inhibiting group, wherein  $\text{R}^1$  and  $\text{R}^2$  each represent, independently, an alkyl group, a halogen atom, or a halogenated alkyl group, and at least one of  $\text{R}^1$  and  $\text{R}^2$  is an electron attractive group selected from the group consisting of halogen atoms and halogenated alkyl groups.

Przybilla et al. and Pawlowski et al. (US 6,358,665) describe a hydroxystyrene-based resin which contains an acid dissociable, dissolution inhibiting group (see page 502 of Przybilla et al.; and column 14, lines 4-41 of Pawlowski et al.).

However, in both references, there is no description of a structural unit derived from a (meth)acrylate ester containing an acid dissociable, dissolution inhibiting group. Feiring et al. describes the following in paragraph [0078] and [0078].

The fluorine-containing copolymer further comprises a repeat unit derived from a hydroxyl-substituted acrylate monomer,  $\text{CH}_2=\text{CRCOOR}''$ , or  $\text{CH}_2=\text{C}(\text{CH}_2\text{OH})\text{COOR}'''$ . When the acrylate is  $\text{CH}_2=\text{C}(\text{CH}_2\text{OH})\text{COOR}'''$ ,  $\text{R}'''$  is preferably acid-labile.

However,  $\text{CH}_2=\text{C}(\text{CH}_2\text{OH})\text{COOR}'''$  is not the (meth)acrylate ester containing an acid dissociable, dissolution inhibiting group in the present invention, because the present application defines the term "(meth)acrylate" as acrylate and/or methacrylate (see paragraph [0056]).

As described above with respect to claim 1, a  $-\text{CR}^1\text{R}^2\text{OH}$  group is introduced at a terminal of a principal chain of the resin, not at a plurality of side chains of repeating units in the

resin. Therefore, claim 23 is also distinct from the cited references in the structure of the resin. (Exhibit B). Thus, claims 23 and 24 are also patentable over the cited references.

The Examiner also rejected claims 14 and 15 under 35 U.S.C. § 103(a) as being unpatentable over Pawlowski et al. as applied to claim 12, and further in view of Lamanna et al. (US 5,554,664). As discussed above, Pawlowski et al. does not describe or suggest a transfer agent containing a  $-\text{CR}^1\text{R}^2\text{OH}$  group, thus making it impossible to have a structure in which a  $-\text{CR}^1\text{R}^2\text{OH}$  group is introduced only at a terminal of a principal chain of the resin as presently claimed. Lamanna et al. does not remedy the deficiency in the teaching of Pawlowski et al. Thus, claims 14 and 15 cannot be *prima facie* obvious over this combination of references.

#### Unexpected results

In addition, even if the claims were *prima facie* obvious in view of any of the cited references, the claimed invention provides unexpected results that would effectively rebut any such allegation. The present published specification at paragraph [0094] recites that.

In the first aspect, by employing this type of structure for the resist composition resin, the LER characteristics can be improved. In addition, the occurrence of resist pattern collapse can be suppressed. Furthermore, this reduction in pattern collapse improves the resolution. Furthermore, the depth of focus characteristics also improve, and the level of defects also decreases.

Moreover, the Examples of the present specification disclose that when a  $-\text{CR}^1\text{R}^2\text{OH}$  group is introduced at the terminal of a principal chain by using a chain transfer agent, the above effects can be achieved (see Examples 1-9, Table 1). In contrast, these unexpected advantages are not obtained when a  $-\text{CR}^1\text{R}^2\text{OH}$  group is not introduced at the terminal of a principal chain as Comparative Examples 1-3 (page 12, paragraphs [0185] – [0189] and Table 1. Such unexpected results could not have been predicted based on the teachings of any of the cited references, either alone or in combination, and would effectively rebut any allegation of *prima facie* obviousness.

In view of the amendments and comments presented above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. §§102 and 103.

### CONCLUSION

Applicants submit that all claims are in condition for allowance. However, if minor matters remain, the Examiner is invited to contact the undersigned at the telephone number provided below.

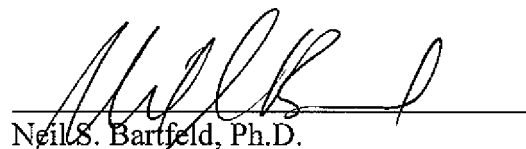
Respectfully submitted,

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Dated: \_\_\_\_\_

8/29/08

By: \_\_\_\_\_

  
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